



2019-nCoV Literature Situation Report (Lit Rep)

April 17, 2020

The scientific literature on COVID-19 is rapidly evolving and these articles were selected for review based on their relevance to Washington State decision making around COVID-19 response efforts. Included in these Lit Reps are some manuscripts that have been made available online as pre-prints but have not yet undergone peer review. Please be aware of this when reviewing articles included in the Lit Reps.

Key Takeaways

- ❑ **One modeling study suggests that a strict restriction on seniors combined with gradual lifting of quarantine for the general population may be a good strategy to limit COVID-19 related deaths while lessening economic damage, and another recommends the country re-open in late May or early June.**
- ❑ **A study on viral clearance in males versus females hypothesizes that testicular reservoirs of the virus may play a role in viral persistence.**
- ❑ **There is important variability in the proportion of the US workforce at risk for COVID-19 complications across regions, counties, and industries that should be considered when targeting control and relief policies, and a staged return to work.**
- ❑ **Baseline platelets and changes were associated with mortality demonstrating that platelets during hospitalization may be important in the prognosis of patients with COVID-19.**

Non-Pharmaceutical Interventions

- Using data on stay-at-home orders and daily confirmed COVID-19 cases at the county level in the U.S., this modeling study suggests that if a national stay-at-home order was issued on March 13 when a national emergency was declared, the number of infections and deaths may have reduced by hundreds of thousands and thousands, respectively.
- The authors suggest that future efforts to control pandemics in the U.S. should coordinate stay-at-home orders at the national level, especially for diseases that have already spread locally and testing availability is delayed.

Fowler et al. (Apr 17, 2020). The Effect of Stay-at-Home Orders on COVID-19 Infections in the United States. Pre-print downloaded Apr 17 from <https://doi.org/10.1101/2020.04.13.20063628>

- In order to assess the impact of quarantine measures on deaths, hospitalizations and economic output, this modeling study that looked at various scenarios finds that when quarantine is quickly lifted, a second outbreak takes place, whereas strict restrictions on seniors combined with gradual lifting of quarantine for the general population resulted in a limited number of deaths and lesser economic damage. The authors recommend this strategy to control the pandemic while making quarantine economically viable.

Goldsztejn et al. (Apr 17, 2020). Public Policy and economic dynamics of COVID-19 spread: a mathematical modeling study. Pre-print downloaded Apr 17 from <https://doi.org/10.1101/2020.04.13.20062802>

Transmission

- In this study, the authors evaluate the time to viral clearance in 68 symptomatic patients (71% males and 29% females), and report that females achieved viral clearance significantly earlier than males, with a median difference of 2 days.
- Shastri et al hypothesize that high expression of ACE2 in testes could indicate that testicular viral reservoirs may play a role in viral persistence, and this could have important implications for understanding the transmission and persistence of SARS-CoV-2.

Shastri et al. (Apr 17, 2020). Delayed clearance of SARS-CoV-2 in male compared to female patients: High ACE2 expression in testes suggests possible existence of gender-specific viral reservoirs. Pre-print downloaded Apr 17 from <https://doi.org/10.1101/2020.04.16.20060566>

Testing and Treatment

- To gain insight on the prevalence of asymptomatic cases among healthcare workers (HCWs), Paradiso et al tested 525 asymptomatic HCWs of a Cancer Institute in Vo'Euganeo (a red zone quarantined area in Northern Italy) using VivaDiag™ antibody testing. They report that none of the 6 workers who tested positive for COVID-19 with the VivaDiag™ kit tested positive using RT-PCR testing, and at 1-week follow-up all 6 were still asymptomatic.
- They infer rapid antibody tests can have the ability to detect persons who had a previous contact with SARS-CoV-2, however these discordant results of antibody tests with RT-PCR stress show that further studies are needed to optimize the utilization of serologic test in asymptomatic persons who are at a high risk for infection.

Paradiso et al. (Apr 17, 2020). Rapid Serological Tests Have a Role in Asymptomatic Health Workers COVID-19 Screening. Pre-print downloaded Apr 17 from <https://doi.org/10.1101/2020.04.15.20057786>

Clinical Characteristics and Health Care Setting

- Girotra et al conducted a simulation study and used survival data of 5,690 patients hospitalized in ICU with a diagnosis of pneumonia or sepsis, and who were receiving mechanical ventilation at the time of cardiac arrest during 2014-2018 to understand survival outcomes in severe COVID-19 patients.
- They found that survival outcomes following in-hospital resuscitation were not uniformly poor, advising against a uniform policy of no resuscitation for all COVID-19 patients with in-hospital cardiac arrest.

Girotra et al. (Apr 17, 2020). Survival After In-Hospital Cardiac Arrest In Critically Ill Patients-Implications for the COVID-19 Pandemic? Pre-print downloaded Apr 17 from <https://doi.org/10.1101/2020.04.11.20060749>

- The authors report on changes in viral load over time in a 27-day old neonate diagnosed with COVID-19 who presented with fever, cough and vomiting. SARS-CoV-2 RNA was detected in all clinical specimens (nasopharynx, oropharynx, stool, saliva, blood and urine) with the highest viral load found in the nasopharynx, which decreased over time, while viral load in stool samples remained high.

- These findings suggest that COVID-19 could be systemic in neonates, affecting multiple organs, including the kidneys and GI tract, thus requiring careful monitoring. The study also highlights good hygiene practices by caregivers.

Han et al. (Apr 16, 2020). Sequential analysis of viral load in a neonate and her mother infected with SARS-CoV-2. Clinical Infectious Diseases. <https://doi.org/10.1093/cid/ciaa447>

- The authors conducted a retrospective cohort study of COVID-19 patients from a hospital in Wuhan to evaluate the association between platelets and poor outcomes and find that thrombocytopenia at admission was associated with mortality of almost three times as high compared to those without thrombocytopenia. Among the 383 patients, 334 (87%) were discharged and 49 (13%) died.
- The finding that baseline platelets and changes were associated with mortality demonstrates that platelets during hospitalization may be important in the prognosis of patients with COVID-19.

Liu et al. (Apr 16, 2020). Association between platelet parameters and mortality in coronavirus disease 2019: Retrospective cohort study. Platelets.

<https://doi.org/10.1080/09537104.2020.1754383>

Mental Health and Personal Impact

- Gao et al conducted a cross-sectional survey among 4,872 adult Chinese citizens during Jan 31 to Feb 2, using an online survey to assess the prevalence of mental health problems and the association with social media exposure (SME). The prevalence of depression, anxiety and combination of depression and anxiety (CDA) was 48%, 23% and 19%, respectively, and more than 80% of participants reported frequent SME. There was a positive correlation between mental health problems and frequent SME.
- The authors argue that misinformation about COVID-19 on social media could result in confusion and fear, harming people's mental health. While this study is specific to social media in China, it could have implications for the U.S., where social media is widely used.

Gao et al. (Apr 16, 2020). Mental health problems and social media exposure during COVID-19 outbreak. Plos One. <https://doi.org/10.1371/journal.pone.0231924>

Modeling and Prediction

- Aboelkassem presents a model to predict the total number of COVID-19 cases and deaths in the U.S. and the reopening date. The model estimates that by mid-June or early July the outbreak will sharply decline, and the U.S. will have about 736K confirmed cases and about 41K deaths.
- The author suggests that late May or early June could be a good time to end the shutdown order and reopen the country.

Aboelkassem (Apr 12, 2020). COVID-19 pandemic: A Hill type mathematical model predicts the US death number and the reopening date. Pre-print downloaded Apr 17 from <https://doi.org/10.1101/2020.04.12.20062893>

Public Health Policy and Practice

- The authors argue that BCG vaccination may not be the primary cause for lower infection and case fatality rates (CFR) observed in select countries with universal BCP policies. They believe the large variation in CFR could be resulting from underlying population characteristics, such as age, co-morbidities and genetics, and from different SARS-CoV-2 strains circulating in different regions.

Singh et al. (Apr 17, 2020). BCG Vaccines may not Reduce COVID-19 Mortality Rates. Pre-print downloaded Apr 17 from <https://doi.org/10.1101/2020.04.11.20062232>

- Using data from the National Health Information Survey and Quarterly Census of Earnings and Wages, Maher et al estimate the proportion of the U.S. workforce at-risk for COVID-19 complications across regions, counties and industries, and share that: (1) Nearly 80% of all workers have at least one health risk and 11% are over 60 with an additional health risk, (2) Workers in rural and urban essential industries where working from home is less frequently an option, are less likely to: i) have of insurance coverage, ii) be white; and more likely to be in the bottom half of the income distribution and (3) Essential industries in rural counties are often made up of smaller and more homogenous workforces, making them particularly vulnerable to disruptions in the workforce.
- The authors suggest that failure to protect vulnerable workforces could lead to the breakdown of essential industries, cause avoidable deaths and hardship, and could also create further hotspots when communities manage a return-to-work policy.

Maher et al. (Apr 17, 2020). A COVID-19 Risk Assessment for the US Labor Force. Pre-print downloaded Apr 17 from <https://doi.org/10.1101/2020.04.13.20063776>

Other Resources and Commentaries

- [Emerging Lessons from COVID-19 Response in New York City](#)– JAMA (Apr 16)
- [COVID-19 exacerbating inequalities in the US](#)—Lancet (Apr 2020)
- [Review article: gastrointestinal features in COVID-19 and the possibility of faecal transmission](#)—Ailment Pharmacol Ther (Mar 31)
 - This review of case reports and retrospective clinical studies reports a 3% incidence of GI symptoms in COVID-19 patients, and presence of GI symptoms in the absence of respiratory symptoms. Fecal PCR testing was as accurate as respiratory specimen PCR detection and in line with current research, the virus persisted longer in the GI tract than in the respiratory tract.